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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/532,084

04/21/2005

Takashi Yasumura

050251

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05/15/2007

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP

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EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1724

MAIL DATE

DELIVERY MODE

05/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,084

Applicant(s)

YASUMURA ET AL.

Examiner

Ives Wu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

- (1). Applicants' Remarks and Amendments filed on 03/28/2007 have been received.
Claim 19 is amended. Claim 7 is cancelled previously.
A new ground of rejections for claims 1-6,8-20 is presented in the following.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- (2). **Claim 19** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 19 depends on claim 7, which is cancelled.

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

- (3). **Claims 1-4, 6 and 8-20** are rejected under 35 U.S.C. 102(a) as being anticipated by Okumura et al (US20020055030A1), evidenced by Hideo et al (JP 61-009424A).

As to component (A) of a conductive filler in a conductive resin composition in **independent claim 1**, Okumura et al (US20020055030A1) disclose the electroconductive agent, a variety of components such as carbon powders, carbon fibers and metal powders can be employed ([0015], line 1-7).

As to component (C) of a (meth)acrylate in **independent claim 1** and **claim 4**, Okumura et al (US20020055030A1) disclose urethane (meth)acrylate formed by polyurethane oligomer and hydroxyC₂₋₆alkyl (meth)acrylate. The polyurethane oligomer includes a reaction product of diisocyanate and polyether diols such as polycarbonate diols (aromatic polyether diols) the molar ratio of hydroxyl group to isocyanate group of the urethane oligomer is about 0.7/1 to 1.2/1 ([0049]). Therefore, the excess isocyanate group would completely reacted with hydroxyl group of (meth)acrylate, so that no active hydrogen atom is left.

As to the component (C) of a (meth)acrylate having a M_n of 500 to 10,000, which containing 20 to 80 wt% of an aromatic cyclic structural unit in **independent claim 1**, in view of substantially identical (meth)acrylate disclosed by prior art, and by applicants, it is examiner's position to believe that the (meth)acrylate of prior art would inherently possess M_n and aromatic structural unit as claimed. Since USPTO does not have facilities necessary to conduct the measurements. The burden now is shifted to applicants to prove otherwise. *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977).

As to component (B) a urethane-modified epoxy (meth)acrylate in a conductive resin composition in **independent claim 1**, Okumura et al disclose the urethane-modified (meth)acrylate resin ([0046]) by forming the polyurethane oligomer which is reaction product of diisocyanate and a diol. Okumura et al disclose the vinyl ester-series resin (e.g., epoxy (meth)acrylate), which is methacryloyl as evidenced by Hideo et al (JP 61-009424) that the monoepoxide reacted with mono(meth)acrylate forms a unsaturated acrylic ester diols (Abstract). Therefore, the Vinyl ester series resin includes diols. Okumura et al disclose the polyurethane oligomer include urethane-modified epoxy(meth)acrylate and also is urethane (meth)acrylate as evidenced by Hideo et al (JP 61-009424).

As to component (D) of other ethylenically unsaturated monomer in **independent claim 1**, and **claim 11**, Okumura et al (US20020055030A1) radical-polymerizable diluent such as aromatic vinyl ester, in particular, styrene ([0058]-[0060]).

As to the process of obtaining the component (B) of a urethane-modified epoxy (meth)acrylate in **independent claim 1**, it is noticed that the instant claim is composition claim, the patentability of a product does not depend on its method of production. *In re Thorpe*, 777 F.2d 695,698, 277 USPQ 964, 966 (Fed. Cir. 1985).

As to the limitation of **claims 2 and 3**, Okumura et al disclose the novolac type epoxy and other type of epoxy resin in paragraph (3) which includes 30 to 90 wt% of an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit.

As to the limitation of **claim 6**, Okumura et al disclose polycarbonate diols which is known as aromatic polyether diols.

As to the limitation of **claim 8**, in absence of showing the criticality of the records, the optimization value of ratio between component (b) of urethane-modified epoxy (meth)acrylate

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and component (c) of (meth)acrylate to be 95/5 to 50/50 in a known process renders *prima facie obviousness* within one ordinary skill in the art. *In re Boesch*, 617 F.2d, 276, 205 USPQ 215, 219 (CCPA 1980).

As to the limitation of **claim 9**, Okumura et al disclose the wt ratio of the electroconductive agent to the radical-polymerizable thermosetting resin system is from 55/45 to 95/5 ([0063], line 1-3), in other words, the content of component A is to be 55 to 95 wt%.

As to limitation of **claims 13-18, 20**, Okumura et al disclose the separator for solid polymer-type fuel cell being produced by molding the resin composition which comprises an electro-conductive agent and a radical-polymerizable thermosetting resin system and a resin molding method (Abstract, line 1-4).

As to the limitation of **claim 10**, Okumura et al disclose the thermosetting to be 12 wt%, reactive diluent (styrene) to be 8 wt%, conductive fillers to be 80 wt% in Example 2, the distribution of components B, C such as 6 wt% of B taught by Carlson et al and 4 wt% of urethane-(meth)acrylate C taught by Okumura is within 12 wt% meet the instant claim.

As to components (A) – (D) in 1st step method for producing a conductive resin composition in **independent claim 12**, the disclosure of Okumura et al, Carlson et al is incorporated herein by reference, the most subject matters of components, and hydroxyl values, molar ratio as currently claimed, have been recited in applicants' claim 1, and have been discussed therein.

As to kneading step in the method in **independent claim 12**, Okumura et al disclose the resin composition is kneaded with the use of conventional kneader ([0082], line 1-2).

As to 2nd step of reacting the kneaded mixture at a temperature of room temperature to 80 °C in the method in **independent claim 12**, Okumura et al disclose the reaction for 8 hours at 120 °C in Example 1. In absence of showing the criticality of the records, the optimized reaction temperature ranged from room temperature to 80 °C in the known process renders *prima facie obviousness* within one of ordinary skills in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(4). **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al (US20020055030A1) in view of Toshiro et al (JP 03-199230).

As to the limitation of **claim 5**, Okumura et al **do not teach** the polycarbonate diols (polyetherpolyol) to be alkylene oxide adduct of a multinucleate phenolic compound.

However, Toshiro et al (JP 03-199230) **teach** the copolymer polycarbonate diol which is a compound (e.g. phosgene) requiring a dehydrochlorinating process, an alkylene carbonate, a diaryl carbonate or a dialkyl carbonate is reacted with an aliphatic diol prepared by blending 20-80 wt% adduct of a 2,2-(4-hydroxyphenyl)propane shown by the formula with an alkylene oxide and hexanediol to give the object polymer (Constitution).

The advantage of using the polycarbonate diols having an aromatic cyclic structural unit and/or aliphatic cyclic structural unit to be an alkylene oxide adduct of a multinucleate phenolic compound taught by Toshiro et al (JP 03-199230) in the urethane (meth)acrylate is to provide excellent mechanical strength, wet heat resistance, low-temperature characteristics, etc., in the polyurethane product (Abstract).

Therefore, it would have been obvious at time the invention was made to use the polyetherpolyol of Toshiro et al for the polycarbonate diols taught by Okumura et al in order to obtain the advantage cited in the preceding paragraph.

Response to Arguments

(5). Applicant's arguments filed on 3/28/2007 have been fully considered but they are not persuasive.

Applicants assert that the instant composition comprising both urethane (meth)acrylate and urethane-modified epoxy (meth)acrylate in instant claim 1 (page 9, Remarks).

As evidenced by prior art reference Hideo et al (JP 61-009424A), Hideo et al (JP 61-009424A) cites: urethane (meth)acrylate resin is obtained by reacting glycerin mono(meth)acrylate with organic diisocyanate, thus obtain isocyanate compound with hydroxyl-containing (meth)acrylate. The glycerin mono(meth)acrylate is obtained from glycidol (monoepoxides) and (meth)acrylic acid (Abstract). Therefore, the epoxy (meth)acrylate disclosed by prior art reference Okumura et al (US20020055030A1) as vinyl ester-series resin include (meth)acrylate diols capable to form the urethane (meth)acrylate resin by reacting with organo isocyanate. Okumura et al (US20020055030A1) also call this product as polyurethane oligomer in [0048]. Then, the urethane-modified epoxy(meth)acrylate as claimed by applicants is urethane (meth)acrylate in view of foregoing disclosure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner: Ives Wu

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Date: May 11, 2007

DUANE SMITH
PRIMARY EXAMINER

D. A.
5-11-07